

REMARKS

I. Introduction

Claims 1-6 are currently pending in this application, of which claims 1 and 6 are independent. Applicants respectfully submit that in view of the following remarks, the claims are allowable over the cited prior art references and therefore the application should be allowed and passed to issue.

II. Claim Rejections under 35 U.S.C. § 102(b)

Claim 6 was rejected under 35 U.S.C. § 102(b) as allegedly being anticipated by Takahashi (JP 08-287968). Applicants respectfully traverse the rejection.

Claim 6 recites, **“A thin film for a package of an alkaline battery formed by stacking at least an alkali-resistant polymer film having hydrogen gas permeability and a polymer film having gas barrier properties.”**

This configuration of a thin film package of an alkaline battery is shown, for example in FIGS. 1 and 2, in which thin films 1, 3 and 4 that comprise the package are composed of at least an alkali-resistant polymer film having hydrogen gas permeability stacked with a polymer film having gas barrier properties.

Anticipation under 35 U.S.C. § 102 requires that “all of the elements and limitations of the claim must be shown in a single prior reference, arranged as in the claim”. *In re Buszard*, 504 F.3d 1364, (Fed Cir. 2007). At a minimum, Takahashi does not disclose separate film layers, one of which being hydrogen gas permeable and the other having gas barrier properties, as recited in claim 6.

The Examiner refers to paragraphs [0004], [0005] and [0015] of Takahashi on page 3 of the office action mailed July 28, 2009 for allegedly disclosing a thin film formed by stacking a resin film “10” that is made of polyethylene or polypropylene and a resin film “12” that is made of polyamide or polytetrafluoroethylene.

However, it is clear that the Takahashi disclosure does not teach that synthetic resin films 10 and 12 of Takahashi are made of two *different* materials, one being hydrogen gas permeable and the other having gas barrier properties, as recited in instant claim 6.

Furthermore, Takahashi paragraphs [0011] and [0015] of the English machine translation, teach that an aluminum layer 11 is sandwiched with the synthetic resins, lamination is performed and polyethylene terephthalate, polyethylene, polypropylene, poly olefins and polytetrafluoroethylene are used as the synthetic resin. Importantly, Takahashi does not teach or suggest any distinctions in using any one of these various materials. As such, Takahashi does not disclose two polymer films of *different* materials as recited in claim 6.

Moreover, a sealant 9 comprising synthetic resin films 10 and 12 and an aluminum layer 11 mentioned in Takahashi is used during battery *storage*, not for use in the **package** of an alkaline battery as recited in claim 6, and further does not suggest that hydrogen gas permeable properties are desired from the resin films 10 and 12. Therefore, Takahashi does not disclose a combination of stacked polymer thin films, one of which is hydrogen permeable and another that has a gas barrier as recited in claim 6.

Accordingly, it is respectfully submitted that claim 6 is allowable over the cited prior art references.

III. Claim Rejections under 35 U.S.C. § 103(a)

Matsumoto in view of Takahashi and further in view of Kuboki

Claims 1-5 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Matsumoto (JP 63-138668) in view of Takahashi and further in view of Kuboki (JP 2003-017144). Applicants respectfully disagree.

Claim 1 recites, in pertinent part,

“... the first sheet layer, second sheet layer, and third sheet layer each comprise of a thin film formed by stacking at least an alkali-resistant polymer film having hydrogen gas permeability and a polymer film having gas barrier properties; and in each of the first sheet layer and the third sheet layer, the polymer film having hydrogen gas permeability is disposed on the internal surface side.”

This configuration is shown, for example, in FIGS. 1 and 2, in which a first sheet layer 1, second sheet layer 3 and third sheet layer 4 each comprise a thin film formed by stacking at least an alkali-resistant polymer film having hydrogen gas permeability and a polymer film having gas barrier properties; and in each of the first sheet layer 1 and the third sheet layer 4, the polymer film having hydrogen gas permeability is disposed on the internal surface.

The Examiner alleges on pages 3-4 of the office action that Matsumoto discloses a thin air battery having the elements recited in claims 1-5. However, the Examiner concedes on page 4 of the office action mailed that Matsumoto does not disclose a first sheet layer, a second sheet layer and a third sheet layer, each comprising a thin film formed by stacking at least an alkali-resistant polymer film having hydrogen gas permeability and a polymer film having gas barrier properties or the lead elements as recited in the instant claims. Therefore, the Examiner relies on Takahashi for the alleged disclosure of the hydrogen permeable and gas barrier films and Kuboki for the alleged disclosure of the lead configuration.

However, as discussed above, in reference to claim 6, it is clear that the Takahashi disclosure does not teach or suggest that synthetic resin films 10 and 12 are made of two *different materials*, one being hydrogen gas permeable and the other having gas barrier properties, as recited in claim 1.

Although Takahashi is directed to an air battery, it has a different structural configuration than the thin air battery recited in claim 1. Takahashi teaches that an aluminum film 11 sandwiched between synthetic resins 10 and 12 is made thin, in order for hydrogen gas generated during battery storage to permeate through it to the outside, (see paragraphs [0007]-[0008] of the English machine translation).

Moreover, Takahashi paragraphs [0011] and [0015], describe that the aluminum layer was sandwiched with the synthetic resins, lamination was performed and polyethylene terephthalate, polyethylene, polypropylene, poly olefins and polytetrafluoroethylene were used as the synthetic resin. As such, Takahashi does not disclose or suggest a configuration having two polymer films of **different** materials as recited in claim 1.

Furthermore, sealant 9 comprising synthetic resin films 10 and 12 and an aluminum layer 11 mentioned in Takahashi is used during battery storage, not for use in the package of an air battery as recited in claim 1. As such, Takahashi neither discloses nor suggests stacked synthetic resin film layers having an alkali-resistant polymer film having hydrogen gas permeability and a polymer film having gas barrier properties, as recited in claim 1.

Furthermore, Kuboki fails to cure the deficiencies of Matsumoto in view of Takahashi, as at a minimum, Kuboki also fails to teach or suggest a configuration in which, “the first sheet layer, second sheet layer, and third sheet layer each comprise a thin film formed by stacking at

least an alkali-resistant polymer film having hydrogen gas permeability and a polymer film having gas barrier properties.”

Thus, it is clear that none of the cited prior art references, either alone or in combination, teach or suggest the configuration of the thin air battery as recited in claim 1. Accordingly, it is respectfully submitted that claim 1 is allowable. Furthermore, claims 2-5 depend from and further define the subject matter of claim 1 and therefore are also allowable.

Matsumoto in view of Yamazaki and Matsumoto in view of Yamazaki

Claims 1-3 and 5 were rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Matsumoto in view of Yamazaki (U.S. 6,632,538). Applicants respectfully disagree.

The Examiner asserts that Matsumoto discloses a thin air battery, but concedes on page 7 of the office action mailed July 28, 2009 that Matsumoto does not teach the films as recited in claim 1, and therefore relies on Yamazaki for this alleged disclosure. However, a person having ordinary skill in the art would not have found it obvious to combine Matsumoto and Yamazaki in order to achieve the thin air battery configuration recited in claim 1, because such a configuration achieves unexpectedly improved results.

Yamazaki is directed to a Li-ion, not a zinc-air battery. Moreover, zinc-air batteries include potassium hydroxide electrolyte, and potassium hydroxide would not be used in a Li-ion battery. Therefore, a person having ordinary skill in the art would not find it obvious to combine Matsumoto and Yamazaki to achieve the battery configuration recited in claim 1 because Matsumoto and Yamazaki are each directed to different battery types and therefore require varied design considerations.

Moreover, a person having ordinary skill in the art would not have found it obvious to combine the different battery types of Matsumoto and Yamazaki in order to achieve the battery

configuration recited in claim 1, because as shown Tables 1 and 2, thin air batteries having the thin film sheet layers stacked in the configuration recited in claim 1 achieve unexpectedly reduced internal resistance and expansion and increased discharge capacity as compared to other batteries.

Therefore, it is clear that the battery configuration recited in claim 1 is allowable over the cited prior art combination. Furthermore, claims 2-5 depend from and further define the subject matter of claim 1 and therefore are also allowable.

**Matsumoto in view of Yamazaki and Matsumoto in view of Yamazaki and
further in view of Kejha**

Claim 4 was rejected under 35 U.S.C. § 103(a) as allegedly being unpatentable over Matsumoto in view of Yamazaki and further in view of Kejha (U.S. 2004/0018425). Applicants respectfully disagree. As discussed immediately above in reference to the rejection of claims 1-3 and 5 under 35 U.S.C. § 103(a), a person having ordinary skill in the art would not have found it obvious to combine the different battery types of Matsumoto and Yamazaki to achieve the battery configuration recited in claim 1. Moreover, the battery configuration of claim 1 achieves unexpectedly improved battery characteristics – reduced internal resistance, reduced expansion and increased discharge capacity as compared to other batteries.

The Examiner on page 9 of the office action mailed July 28, 2009 concedes that Matsumoto in view of Yamazaki do not disclose a gas barrier films composed of fluorine-containing polymer material as recited in claim 4, and therefore relies on Kejha for this alleged disclosure. However, Kejha fails to cure the deficiencies of Matsumoto in view of Yamazaki, because nothing in the Kejha reference teaches combining the different battery types disclosed in Matsumoto and Yamazaki in order to achieve a battery having the configuration recited in claim

1. Moreover, the battery configuration as recited in instant claim 1 achieves an unexpected improvement in battery characteristics, thus rebutting the assertion of obviousness.


Accordingly, claim 1 is allowable over the cited prior art references. Furthermore, claims 2-5 (including claim 4) depend from and further define the subject matter of claim 1 and therefore are also allowable.

In view of the above remarks, Applicants respectfully submit that the application be allowed and the case passed to issue. If there are any questions regarding this response or the application in general, a telephone call to the undersigned would be appreciated to expedite the prosecution of the application.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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